

## Claims

- [1] 1. A checksum generation apparatus, comprising:  
a control unit which, in response to information on a predetermined length, outputs a control signal when an amount of data corresponding to the predetermined length is received;  
an addition unit which receives data, performs an addition on the received data, and, in response to the control signal, outputs an addition result; and  
a conversion unit which converts the addition result to a checksum.
- [2] 2. The checksum generation apparatus according to claim 1, wherein the checksum has a value of 16 bits.
- [3] 3. The checksum generation apparatus according to claim 1, wherein the addition unit receives data in units of 32 bits plus (an integer X 16 bits) and performs an addition on the received data.
- [4] 4. The checksum generation apparatus according to claim 1, wherein the conversion unit divides the addition result into a sum and a carry, partitions the sum into 16-bit segments, and adds the 16-bit segments to the carry, thereby obtaining a final sum.
- [5] 5. The checksum generation apparatus according to claim 4, wherein, when a carry occurs in the final sum, the conversion unit excludes the carry from the final sum and adds the carry to the carry-excluded final sum, thereby outputting a carry-added final sum.
- [6] 6. The checksum generation apparatus according to claim 5, wherein the conversion unit outputs a 1's complement value of the carry-added final sum as a 16-bit checksum.
- [7] 7. The checksum generation apparatus according to claim 1, wherein the addition unit comprises:  
an adder for adding the received data in units of 32 bits plus (an integer X 16 bits); and  
a carry adder for adding carries generated in the adder.
- [8] 8. The checksum generation apparatus according to claim 1, wherein the conversion unit comprises:  
a partial sum addition unit for excluding a carry from the addition result, partitioning a carry-excluded addition result into 16-bit segments, adding the 16-bit segments, thereby obtaining a partial sum;

a first adder for adding the carry to the partial sum;  
a second adder for adding an addition result of the first adder and a carry occurring in the addition result; and  
a complement calculator for outputting a 1's complement value of the addition result of the second adder.

- [9] 9. A method of generating a checksum, the method comprising the steps of:  
(a) adding input data until a predetermined control signal is received;  
(b) outputting a sum and a carry obtained from the addition result when the control signal is received; and  
(c) adding the sum and the carry and converting the addition result to a checksum.
- [10] 10. The method of generating a checksum according to claim 9, wherein the checksum has a value of 16 bits.
- [11] 11. The method of generating a checksum according to claim 9, wherein the control signal is output when an amount of data corresponding to input data length information is received.
- [12] 12. The method of generating a checksum according to claim 9, wherein, in the step (a), data is received in units of 32 bits plus (an integer X 16 bits) and an addition is performed on the received data.
- [13] 13. The method of generating a checksum according to claim 9, wherein, in the step (c), the addition result is divided into a sum and a carry, the sum is partitioned into 16-bit segments, and the 16-bit segments are added to the carry, thereby a final sum being obtained.
- [14] 14. The method of generating a checksum according to claim 13, wherein, when a carry occurs in the final sum, in the step (c), the carry is excluded from the final sum and added to the carry-excluded final sum, thereby a carry-added final sum being output.
- [15] 15. The method of generating a checksum according to claim 14, wherein, in the step (c), a 1's complement value of the carry-added final sum is output as a 16-bit checksum.
- [16] 16. The method of generating a checksum according to claim 9, wherein the step (b) further comprises the steps of:  
(b1) adding the received data in units of 32 bits plus (an integer X 16 bits); and  
(b2) adding carries generated in the step (b1).
- [17] 17. The method of generating a checksum according to claim 9, wherein the step

(c) further comprises the steps of:

(c1) excluding a carry from the addition result, partitioning a carry-excluded addition result into 16-bit segments, adding the 16-bit segments, thereby obtaining a partial sum;

(c2) adding the carry to the partial sum;

(c3) adding an addition result of the step (c2) and a carry occurring in the addition result; and

(c4) outputting a 1's complement value of the addition result of the step (c3).

- [18] 18. A computer-readable storage medium where a program executed by a computer is stored, the program comprising a method of generating a checksum, wherein the method comprises the steps of:
- (a) adding input data until a predetermined control signal is received;
  - (b) outputting a sum and a carry obtained from the addition result when the control signal is received; and
  - (c) adding the sum and the carry and converting the addition result to a checksum.